

Date: Thu, 3 Nov 94 04:30:35 PST
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: List
Subject: Ham-Homebrew Digest V94 #324
To: Ham-Homebrew

Ham-Homebrew Digest Thu, 3 Nov 94 Volume 94 : Issue 324

Today's Topics:

40 - 70 MHz crystal filter design
 antenna tuner
 buying help.
 FM Crystal Set (2 msgs)
 Interdigital Filters (2 msgs)
 Intermod Help!
Program for desining low pass filters
 Source of ferrite cores
 Where does the power go

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: 2 Nov 1994 14:46:15 GMT
From: kirkland@bgtys22.bnr.ca (Bill Kirkland)
Subject: 40 - 70 MHz crystal filter design

Are there any articles or programs detailing design of crystal filters in the
40 - 70 Mhz range.

Bill Kirkland

Date: 02 Nov 94 09:13:00 -0500
From: Bob.Klug@f239.n109.z1.fidonet.org (Bob Klug)

Subject: antenna tuner

Does anybody have plans for an easy-to-build antenna tuner?

I am new to the shortwave listening hobby. For my birthday last year my girlfriend bought me a "boat anchor" --a Blaupunkt model 40103 AM/FM/SW radio & phonograph player that is probably 25 years old. She got it at a local flea market for \$25. I bought a 70 ft piece of stranded copper wire for an antenna and hung it in my attic. I get pretty good reception, but I read Harry Helm's book on shortwave listening and he recommends using an antenna tuner. I got plans for one from Panaxis but it involves winding 44 turns of wire around a core. This will be my very first attempt at building any equipment and I am afraid winding 44 turns of wire around a core and making 12 taps from it will be more difficult for me to get working than I realize.

Can anybody offer me an easier-to-build model, or give me any other advice or encouragement? Thanks.

Bob Klug

Fidonet: Bob Klug 1:109/239

Internet: Bob.Klug@f239.n109.z1.fidonet.org

Date: 28 Oct 94 19:58:28 CST

From: rwitcher@vax1.umkc.edu

Subject: buying help.

just by the goddammed coors light, and be done with it.

Date: 2 Nov 94 17:43:27 GMT

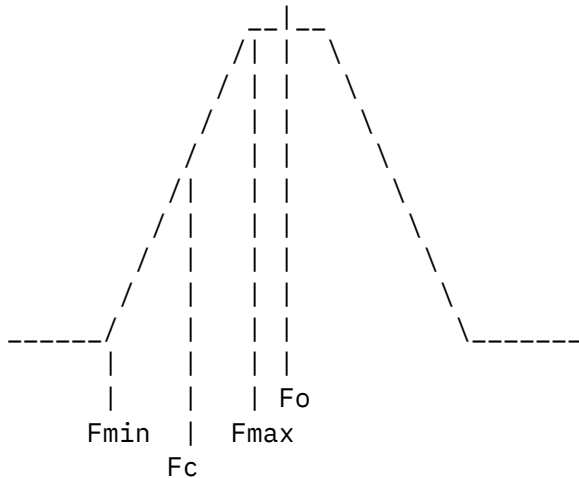
From: mack@mails.imed.COM

Subject: FM Crystal Set

Ian Mitchell asked how the crystal set works in digest #323.

He correctly mentions that to receive FM it acts as a slope detector. A slope detector uses the selectivity curve of the tuned circuit to convert the FM into AM which is then detected by the diode. If all of the energy of the FM circuit is below the center frequency (F_o) of the tuned circuit, then frequencies closer to F_o will have higher amplitudes than lower frequencies. This has the effect of amplitude modulating the signal. Below is a model of what the selectivity curve of a single tuned circuit response looks like with F_o , F_c (the carrier of the FM), F_{max} (high freq for maximum deviation of FM signal), and F_{min} (low freq

for maximum deviation of FM signal) shown. The name slope detection comes from using the slope of the V_{out} vs V_{in} curve as shown below.



There is an error in Ian's schematic. The diode detector MUST have a DC return to ground. Because of that I suspect that the .001 uF capacitor with L2 to ground should be deleted.

Ray Mack
WD5IFS
mack@mails.imed.com

Date: 2 Nov 1994 01:57:45 GMT
From: jdevenport@lanl.gov (Jim WB5A0X)
Subject: FM Crystal Set

Ian, the described circuit is only a regular run of the mill AM detector. I'd be interested in the results of such a circuit on FM, though since broadcast FM is SO broad it might well detect usable audio with slope detection. Slope detection of FM works on the principle that you tune to the "side" of an FM sig with an AM receiver and the frequency "wobbles" of the FM carrier come across as amplitude variations in the receiver since the signal strength is, in fact, varying as the frequency slides back and forth in and out of the AM receivers bandwidth (VERY wide in the case of similar crystal detectors with NO IF filtering). The audio thus recovered is not as loud as when using a good FM detector but if you have sufficient audio gain it produces quite usable results.... years ago while in college in the mid 1970's I homebrewed a simple walkie-talkie in a bud minibox using a VHF engineering transmitter strip and a simple converter in front of a garden variety AM portable transistor receiver.... it was so quiet with no signal present I didn't need squelch, it was very stable, and I

could even separate fairly close (in frequency) repeaters so long as they weren't PHYSICALLY close! Wish I hadn't cannibalized it, that thing was a kick to use in front of old timer appliance op hams.....

I also (and you of course still can) have listened to many a 10 meter FM QSO with a normal AM rx. The trick is to tune in for maximum signal strength, then tune off to the "side" of the signal slowly until the audio becomes intelligible. It usually takes some tinkering to get the best audio, but if tuned properly it will produce surprisingly good audio. That crystal detector circuit likely would be so broad..... it may work fine since FM broadcast is on the order of 100 KHZ wide. And if 2 stations are fairly close to each other you likely know the result.... more than one song at a time or none, depending on how far apart they are in frequency.

Jim Devenport WB5A0X

Date: Thu, 27 Oct 94 09:29:02 -0500
From: Richard Trok <Richard.Trok@f747.n115.z1.fidonet.org>
Subject: Interdigital Filters

FROM:RTR0K@radiohobby.chigate.com

The program listing that you sent for Interdigital Bandpass Filters was received incomplete. It ended at Line 930.

I am very much interested in this program and would appreciate it if you could resend it.

Thanks

Rich NI9S

X SLMR 2.1a X

Date: Thu, 27 Oct 94 09:28:00 -0500
From: Richard Trok <Richard.Trok@f747.n115.z1.fidonet.org>
Subject: Interdigital Filters

TO:KA70EI@uugate.wa7slg.ampr.org
FROM:RTR0K@radiohobby.chigate.com

The program listing that you sent for Interdigital Bandpass Filters was received incomplete. It ended at Line 1320.

I am very much interested in this program and would appreciate it if you would resend it.

Thanks

Rich NI9S

X SLMR 2.1a X

Date: 2 Nov 1994 01:40:04 GMT
From: jdevenport@lanl.gov (Jim Devenport WB5A0X)
Subject: Intermod Help!

Are you SURE of the "cellular" tower being the source of the interference?
if so, or if you know the main source of RFI and its frequency range, you
can knock the bad interference down 20 to 30 dB (WADS!) with the installation
of a simple coax notch filter.

For 800 MHZ (cellular), merely cut a piece of RG-58 to approx. 2 1/4 inches, put a
bnc fitting on

one end, leave the other end open, and install it wit a tee fitting on your
HT ant connection, the jpole coax going to the other port of the tee.

For 450 MHZ, make the coax stub 6 1/4" long

for 150 MHZ, make the stub 18 3/4" long

The basic trick is to cut a coax stub to the 1/4 wave electrical length
so the coax will resonate at the offending frequency. Since coax has a
"velocity factor" in that rf travels more slowly thru it than solid
copper wire or air, the velocity factor has to be "factored in".

RG58 and may other types of flexible coax has a velocity factor of .6667
so you first find the 1/4 wave length:

(example) 850 MHZ= 468 divided by 850; this is the half wavelength,
then divide by 2 to get the 1/4 length (or simply start by dividing the
desired freq into 234) , which should come out close to .275 feet or 3.3
inches, then multiply that by the velocity factor (3.3 X .67= 2.21 inches
or very close to 2 1/4 inches. It helps to include the effective length
of the BNC tee at this UHF frequency range...

these make very effective notch filters but do have insertion loss,
especially at frequencies near the notch frequency.... however getting rid
of that much rfi may well outweigh any losses incurred.

73,

Jim Devenport

Date: 2 Nov 1994 16:46:06 GMT
From: ignacy@misz.animal.uiuc.edu (Ignacy Misztal)
Subject: Program for desining low pass filters

In <CyM5py.88M@ncifcrf.gov>, mack@ncifcrf.gov (Joe Mack) writes:

>In article <395rsv\$1bs@vixen.cso.uiuc.edu> ignacy@uiuc.edu (Ignacy Misztal)
writes:

>>I am looking for formula or at best a PD program to design low pass

>>elliptic filters. I am also looking for help with filters that have
>>all inductances the same.
>>

I forgot to say that these are transmitting filters made of coils and
capacitances.

Ignacy Misztal	Ham radio: N09E, SP8FWB
E-mail: ignacy@uiuc.edu	
University Of Illinois	1207 W. Gregory Dr., Urbana, IL 61801, USA
tel. (217) 244-3164	Fax: (217) 333-8286

Date: Wed, 2 Nov 1994 15:09:39 GMT
From: dstock@hpqmdla.sqf.hp.com (David Stockton)
Subject: Source of ferrite cores

David Crooke (dcc@dcscs.ed.ac.uk) wrote:
: My father (GM0RHP) is looking for a source of 4" long by 1/4" dia. ferrite
: core rods to build some fancy antenna. The only source he knows of is in
: California, USA - is there anywhere closer or am I best to just order them
: on plastic and have them pop them in the post in a jiffy bag?

: Dave

I can probably help. I may even have something suitable in my junk
box. I've not seen your dad for some time.

There IS life in the UK on this group!

Cheers

David GM4ZNX

Date: Thu, 3 Nov 1994 02:57:29 GMT
From: gary@ke4zv.atl.ga.us (Gary Coffman)
Subject: Where does the power go

In article <3998nm\$c4c@sunb.ocs.mq.edu.au> guy@macadam.mpce.mq.edu.au (Guy
Fletcher) writes:

>
>This is a rather different way of looking at the question,
>hence the new thread. Considered comments welcome.

You've said it much better than anyone else. The rest of us have been trying to stretch other models to say the same thing, sometimes without much success. If I may summarize, real power always flows towards the load, any heating in the amplifier is the result of loss of efficiency due to a poor load impedance at the amplifier output terminals. All else is chimera.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		emory!kd4nc!ke4zv!gary
534 Shannon Way		Guaranteed!		gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244				

Date: Mon, 31 Oct 1994 20:46:16 GMT
From: kludge@netcom.com (Scott Dorsey)

References<19940ct30.045752.13121@ke4zv.atl.ga.us>
<39164j\$ohr@elaine.teleport.com>, <19940ct31.001225.19727@ke4zv.atl.ga.us>
Subject: Re: THE LITTLE RAZOR BLADE RADIO (UPDATE)

In article <19940ct31.001225.19727@ke4zv.atl.ga.us> gary@ke4zv.atl.ga.us (Gary Coffman) writes:

>In article <39164j\$ohr@elaine.teleport.com> burt@teleport.com (Burt Keeble) writes:

>>So far, the only sources of high carbon steel that I have found are
>>cutting implements (razor blades, carving blades, etc....). I would
>>like a source that isn't potentially dangerous.

>>

>>Any suggestions?

>

>Chain saw bars, cold chisels, files, etc are all high carbon steel.

Cast iron isn't high carbon steel, but works well for a steel detector anyway if you can get a polished section. Still, I always had better luck with copper oxide detectors myself (and copper oxide is everywhere, unfortunately).

--scott

--

"C'est un Nagra. C'est suisse, et tres, tres precis."

Date: Wed, 2 Nov 1994 15:05:52 GMT
From: zlau@arrl.org (Zack Lau (KH6CP))

References<19940ct25.153307.2220@ke4zv.atl.ga.us>
<19940ct25.204901.20098@arrl.org>, <19940ct29.173008.10434@ke4zv.atl.ga.us>
Subject: Re: Where does the power go?

Gary Coffman (gary@ke4zv.atl.ga.us) wrote:

: Class AB1 amplifiers routinely achieve 65% efficiency from DC input
: to RF output in VHF TV broadcast service. Tubes certainly aren't
: 100% efficient, but that's not because of some output impedance
: resistor. It's because of contact resistance, back bombardment,
: and plain old I^2R losses in the tube structure. Every attempt
: is made to minimize these losses. Tube contact surfaces are silver
: plated, and made large, tube structure lengths are minimized, and
: suppressor grids are used in some cases. Flowing 12 amps at 8 kV
: can cause a tube, and cavity, to heat, but not 48 kWs worth.

$8000V/12 \text{ amps} \times .35 = 233 \text{ ohms}$

Can you further break down these losses--how much is
due to to each factor? I have to admit that I'm surprised
that contact losses would be worth mentioning, particularly
since they involve large, silver plated surfaces. I use
cheap molex connectors with little tin plated contacts, and
they aren't significant in a circuit with involving 2 amps
at 12 volts ($12V/2\text{amps} = 6 \text{ ohms}$).

--

Zack Lau KH6CP/1 2 way QRP WAS
 8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

Date: Wed, 2 Nov 1994 01:59:06 GMT
From: gary@ke4zv.atl.ga.us (Gary Coffman)

References<19940ct31.001225.19727@ke4zv.atl.ga.us> <kludgeCyK1p5.95D@netcom.com>,
<395svn\$ksa@kelly.teleport.com>
Reply-To: gary@ke4zv.atl.ga.us (Gary Coffman)
Subject: Re: THE LITTLE RAZOR BLADE RADIO (UPDATE)

In article <395svn\$ksa@kelly.teleport.com> burt@teleport.com (Burt Keeble) writes:
>
>Well, how do I make a copper oxide detector? Maybe that would be a
>better component?

Think pennies. That green coating old copper pennies get is a copper
oxide.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		emory!kd4nc!ke4zv!gary
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Lawrenceville, GA 30244				

End of Ham-Homebrew Digest V94 #324
